

earth dam should have an impervious core, enough ballast to insure its stability, and much attention should be given to a vigorous turf cover to prevent erosion.

Turning from economics to aesthetics, the selection of a site should be incorporated with a study of natural focal points of attention, such as major trees, rock outcroppings, and so forth, which can be preserved to enhance the overall beauty. Much care and consideration should be given to contouring exposed banks to avoid an unnatural effect. This often means contouring for an extensive distance back from the water line of the lake itself. The movement of certain types of major trees, while expensive, is often practical and desirable. Plantings of smaller trees and shrubs in key positions can sometimes have a remarkable effect. All banks, in addition to careful contouring at subgrade, should then have an adequate layer of subsoil spread upon them in order to assure a healthy protective sod to prevent erosion.

Since a lake can be a most attractive addition to a golf course, the

third area for prime consideration is the possibility of having the lake become an integral part of play. This can occur, of course, by having it become an actual water carry, or as a lateral hazard, or simply as a scenic view. Such views can sometimes be established from many different holes by the creation of a single lake, thus providing a remarkable change in the golf course.

If the lake is used as a water carry, it is often possible by the use of multiple tees and a properly positioned fairway to provide a truly challenging shot from the championship tee, an exciting shot from the regular tee, with the choice of a safe shot for the poorer golfer and an even less demanding shot from the women's tee.

So if a lake appears to be a solution to your water shortage problem, let your imagination soar, plan wisely, proceed legally, supervise closely, and perhaps surprise yourself with the bonus of an economic success as well as a handsome improvement to your golf course.

Irrigation Systems — Economics

The Automatic System

By CHARLES McCREA, Golf Course Superintendent

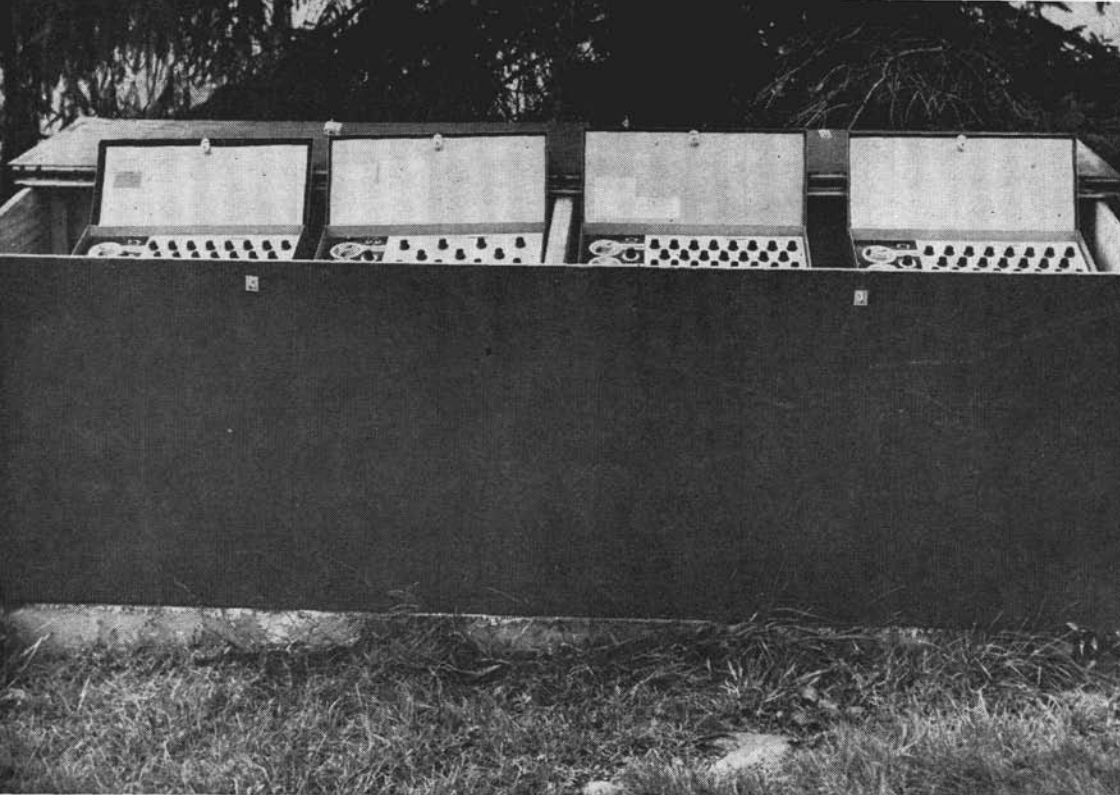
Perhaps at some future date as historians write of the Twentieth Century, they will call it the century of automation. This is especially true of golf courses when you consider irrigation systems.

In the Northeast, automatic systems are out of the novelty class. With the continuance of our four-year drought, labor problems, increased play, and rising standards

of excellence, more clubs are wondering whether to convert to, or install an automatic or at least a more modern irrigation system.

The unanswered question is will the automatic systems stand up to the test of time? Ten years from now we will have the answer.

Well designed manual systems with sufficient water capacity can still operate efficiently. Two courses indi-



Clocks for the control of automatic irrigation valves are housed in a protective box. Such batteries of controls portray a complex system, but when the golf course superintendent becomes thoroughly acquainted with the controls, he is afforded a degree of precision in irrigation not available with manual systems.

cated that of the amount spent for labor, less than 5% was used for irrigation. With an automatic system this percentage can be cut further with labor savings of from \$2,500 to \$5,000.

Although a manual system with hose and travelers allows greater flexibility, it should only be considered as a last resort. The operational costs become excessive. Also, there is the added expense of hose purchase and repair which would be higher than for any other type system.

Another factor influencing system selection and operational cost is yearly rainfall. The Northeast averages 40 inches of rain per year, with

the distribution almost even throughout the year. As a result, we don't irrigate as many times per year as other parts of the country, and therefore, we have to operate our automatic systems for a greater number of years trouble-free to re-coup the increased outlay for an automatic system. I'm in favor of automatic systems for golf courses in the Northeast, but I think there are important reasons other than just economics. Member convenience in that they may never have to play when the system is operating and the fact that the superintendent has complete control over the water program alone are as good reasons as any possible labor savings in deciding to go automatic.